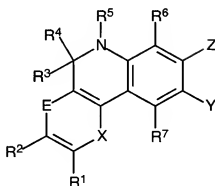


CLAIMS

We claim

- 5 1. A compound having a formula



10 wherein

R¹ and R² are independently selected from the group consisting of hydrogen, cyano, halogen, carboxylic acid, sulfonic acid, C₁-C₆ alkyl, C₁-C₆ alkoxy, aryl, heteroaryl, -L-R_x and -L-S_c, wherein said alkyl or alkoxy is optionally substituted by carboxylic acid, sulfonic acid, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl, cyano, halogen, azido, carboxylic acid, sulfonic acid, or halomethyl;

20 or R¹ in combination with R² forms a fused aromatic or heteroaromatic ring that is optionally sulfonated one or more times, or said ring is substituted by -L-R_x or -L-S_c;

or R² in combination with R³ forms a 5- or 6-membered alicyclic ring;

25 R³ and R⁴ are independently selected from the group consisting of hydrogen, C₁-C₆ alkyl, aromatic or heteroaromatic ring, -L-R_x and -L-S_c, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, hydroxy, or halogen and said aromatic or heteroaromatic ring is optionally substituted one or more times by C₁-C₆

alkyl, C₁-C₆ alkoxy, C₁-C₆ perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

or R³ in combination with R⁴ forms a 5- or 6-membered alicyclic ring;

R⁵ is independently selected from the group consisting of hydrogen, methyl, carboxymethyl, C₂-C₆ alkyl, aryl, heteroaryl, -L-R_x and -L-S_C, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

R⁶ is independently selected from the group consisting of hydrogen, cyano, halogen, carboxylic acid, sulfonic acid, C₁-C₆ alkyl, C₁-C₆ alkoxy, aryl, heteroaryl, -L-R_x and -L-S_C, wherein said alkyl or alkoxy is optionally substituted by carboxylic acid, sulfonic acid, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl, cyano, halogen, azido, carboxylic acid, sulfonic acid, or halomethyl;

or R⁴ in combination with R⁵, or R⁵ in combination with R⁶, forms a 5- or 6-membered alicyclic ring;

R⁷ is independently selected from the group consisting of hydrogen, C₁-C₆ alkyl, C₁-C₆ alkoxy, -L-R_x and -L-S_C;

one of X and E is O, S, NR⁶, or CR^{1'}=CR^{2'}, and the other is absent;

wherein R⁸ is independently selected from the group consisting of hydrogen, methyl, carboxymethyl, C₂-C₆ alkyl, -L-R_x and -L-S_C, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen; and

R^{1'} and R^{2'} are independently selected from the group consisting of hydrogen, cyano, halogen, carboxylic acid, sulfonic acid, C₁-C₆ alkyl, C₁-C₆ alkoxy, aryl, heteroaryl, -L-R_x and -L-S_C, wherein said alkyl or alkoxy is optionally substituted by carboxylic acid, sulfonic acid, or halogen and said aryl or heteroaryl is optionally substituted one or more

times by C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl, cyano, halogen, azido, carboxylic acid, sulfonic acid, or halomethyl;

- 5 Y is independently selected from the group consisting of H, OH, NH₂, NO, -(CO)-R⁹, - (CO)-O-R¹⁰, wherein said R⁹ and R¹⁰ are independently H, C₁-C₆ alkyl, or a substituted or unsubstituted aryl or heteroaryl ring system having 1-2 rings;

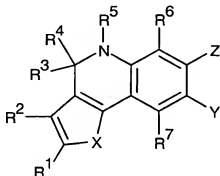
- 10 Z is independently selected from the group consisting of H, OH, NHR¹⁷, SH, or C(CR¹¹R¹²)₂OH; wherein said R¹⁷ is a C₁-C₆ alkyl that is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen and said R¹¹ and R¹² are independently C₁-C₆ alkyl that are optionally substituted by carboxylic acid, sulfonic acid, or halogen, or R¹¹ and R¹² taken in combination form a 5- or 6-membered alicyclic ring;

15 wherein L is a covalent linkage;

R_x is a reactive group; and

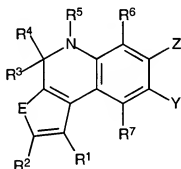
S_C is a conjugated substance.

- 20 2. The compound according to Claim 1, wherein one of X and E is O, S, or CR^{1'}=CR^{2'}, and the other is absent.
3. The compound according to Claim 2, wherein said compound has the formula



- 25 wherein X is O or S.

4. The compound according to Claim 2, wherein said compound has the formula



5

wherein E is O or S.

5. The compound according to Claim 3, wherein X is S.

- 10 6. The compound according to Claim 1, wherein

R¹ is hydrogen or sulfonic acid;

R³ and R⁴ are each methyl;

15

R⁶ and R⁷ are each hydrogen or methyl; and

Z is OH.

- 20 7. The compound according to Claim 1, wherein Y is H or -(CO)-H or NO.

8. The compound according to Claim 1, wherein said L is independently a single covalent bond or a covalent linkage having 1-20 nonhydrogen atoms selected from the group consisting of C, N, O, P, and S.

25

9. The compound according to Claim 1, wherein said R_x is independently selected from the group consisting of an acrylamide, an activated ester of a carboxylic acid, an acyl azide,

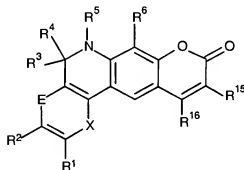
an acyl nitrile, an aldehyde, an alkyl halide, an amine, an anhydride, an aniline, an aryl halide, an azide, an aziridine, a boronate, a carboxylic acid, a diazoalkane, a haloacetamide, a halotriazine, a hydrazine, an imido ester, an isocyanate, an isothiocyanate, a maleimide, a phosphoramidite, a reactive platinum complex, a sulfonyl halide, and a thiol group.

5

10. The compound according to Claim 1, wherein said S_C is independently selected from the group consisting of an amino acid, a peptide, a protein, a tyramine, a carbohydrate, an metal chelating moiety, a nucleoside, a nucleotide, an oligonucleotide, a nucleic acid, a haptent, a psoralen, a drug, a hormone, a lipid, a lipid assembly, a polymer, a polymeric microparticle, a biological cell, and a virus.

10

11. A compound having a formula



15

wherein R^1 , R^2 , and R^6 are independently selected from the group consisting of hydrogen, cyano, halogen, carboxylic acid, sulfonic acid C_1 - C_6 alkyl, C_1 - C_6 alkoxy, aryl, heteroaryl, $-L-R_x$ and $-L-S_C$, wherein said alkyl or alkoxy is optionally substituted by carboxylic acid, sulfonic acid, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C_1 - C_6 alkyl, C_1 - C_6 perfluoroalkyl, cyano, halogen, azido, carboxylic acid, sulfonic acid, or halomethyl;

20

or R^1 in combination with R^2 forms a fused aromatic or heteroaromatic ring that is optionally sulfonated one or more times, or said ring is substituted by $-L-R_x$ or $-L-S_C$;

25

5 R^3 and R^4 are independently selected from the group consisting of hydrogen, C_1 - C_6 alkyl, an aromatic or heteroaromatic ring, $-L-R_x$ and $-L-S_c$, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, hydroxy, or halogen and said aromatic or heteroaromatic ring is optionally substituted one or more times by C_1 - C_6 alkyl, C_1 - C_6 alkoxy, C_1 - C_6 perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

10 or R^2 in combination with R^3 , or R^3 in combination with R^4 , forms a 5- or 6-membered alicyclic ring;

R^5 is independently selected from the group consisting of hydrogen, methyl, carboxymethyl, C_2 - C_6 alkyl, aryl, heteroaryl, $-L-R_x$ and $-L-S_c$, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C_1 - C_6 alkyl, C_1 - C_6 perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

15

or R^4 in combination with R^5 , or R^5 in combination with R^6 , forms a 5- or 6-membered alicyclic ring;

20 one of X and E is O, S, NR^8 , or $CR^{1'}=CR^{2'}$ and the other is absent;

wherein R^8 is independently selected from the group consisting of hydrogen, methyl, carboxymethyl, C_2 - C_6 alkyl, $-L-R_x$ and $-L-S_c$, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen; and

25

$R^{1'}$ and $R^{2'}$ are independently selected from the group consisting of hydrogen, cyano, halogen, carboxylic acid, sulfonic acid, C_1 - C_6 alkyl, C_1 - C_6 alkoxy, aryl, heteroaryl, $-L-R_x$ and $-L-S_c$, wherein said alkyl or alkoxy is optionally substituted by carboxylic acid, sulfonic acid, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C_1 - C_6 alkyl, C_1 - C_6 perfluoroalkyl, cyano, halogen, azido, carboxylic acid, sulfonic acid, or halomethyl;

30

R¹⁵ and R¹⁶ are independently selected from the group consisting of hydrogen, cyano, nitro, halogen, carboxylic acid, sulfonic acid, C₁-C₆ alkyl, an aromatic or heteroaromatic ring system having 1-2 fused rings, -L-R_x and -L-S_C, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, or halogen and said aromatic or heteroaromatic ring system is optionally substituted one or more times by C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

wherein L is a covalent linkage;

R_x is a reactive group; and

S_C is a conjugated substance.

12. The compound according to Claim 11, wherein said one of X and E is O or S.

13. The compound according to Claim 12, wherein

R⁶ and R⁷ are hydrogen;

R³ and R⁴ are each methyl;

R¹ is hydrogen or sulfonic acid;

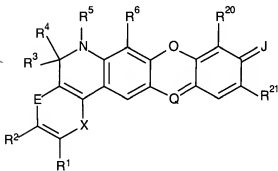
one of R¹⁵ and R¹⁶ is -L-R_x or -L-S_C, and the other is hydrogen, C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl; or cyano;

wherein L is a single covalent bond, or L is a covalent linkage having 1-20 nonhydrogen atoms selected from the group consisting of C, N, O, P, and S, and

wherein R_x is independently selected from the group consisting of an acrylamide, an activated ester of a carboxylic acid, an acyl azide, an acyl nitrile, an aldehyde, an alkyl halide, an amine, an anhydride, an aniline, an aryl halide, an azide, an aziridine, a boronate, a carboxylic acid, a diazoalkane, a haloacetamide, a halotriazine, a hydrazine, an imido ester, an isocyanate, an isothiocyanate, a maleimide, a phosphoramidite, a reactive platinum complex, a sulfonyl halide, and a thiol group; and

wherein S_C is independently selected from the group consisting of an amino acid, a peptide, a protein, a tyramine, a carbohydrate, an metal chelating moiety, a nucleoside, a nucleotide, an oligonucleotide, a nucleic acid, a hapten, a psoralen, a drug, a hormone, a lipid, a lipid assembly, a polymer, a polymeric microparticle, a biological cell, and a virus.

14. The compound according to Claim 11, wherein one of said R^{15} or R^{16} is an aromatic or heteroaromatic ring system having 1-2 fused rings that is optionally substituted one or more times by C_1 - C_6 alkyl, C_1 - C_6 perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl.
15. A compound having a formula:



wherein R^1 , R^2 , and R^6 are independently selected from the group consisting of hydrogen, cyano, halogen, carboxylic acid, sulfonic acid C_1 - C_6 alkyl, C_1 - C_6 alkoxy, aryl, heteroaryl, $-L-R_X$ and $-L-S_C$, wherein said alkyl or alkoxy is optionally substituted by carboxylic acid, sulfonic acid, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C_1 - C_6 alkyl, C_1 - C_6 perfluoroalkyl, cyano, halogen, azido, carboxylic acid, sulfonic acid, or halomethyl;

or R^1 in combination with R^2 forms a fused aromatic or heteroaromatic ring that is optionally sulfonated one or more times, or said ring is substituted by $-L-R_X$ or $-L-S_C$;

5 R^3 and R^4 are independently selected from the group consisting of hydrogen, C_1-C_6 alkyl, an aromatic or heteroaromatic ring, $-L-R_X$ and $-L-S_C$, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, hydroxy, or halogen and said aromatic or heteroaromatic ring is optionally substituted one or more times by C_1-C_6 alkyl, C_1-C_6 alkoxy, C_1-C_6 perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

10 or R^2 in combination with R^3 , or R^3 in combination with R^4 , forms a 5- or 6-membered alicyclic ring;

15 R^5 is independently selected from the group consisting of hydrogen, methyl, carboxymethyl, C_2-C_6 alkyl, aryl, heteroaryl, $-L-R_X$ and $-L-S_C$, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C_1-C_6 alkyl, C_1-C_6 perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

or R^4 in combination with R^5 , or R^5 in combination with R^6 , forms a 5- or 6-membered alicyclic ring;

20 one of X and E is O, S, NR^8 , or $CR^{1'}=CR^{2'}$, and the other is absent;

wherein R^8 is independently selected from the group consisting of hydrogen, methyl, carboxymethyl, C_2-C_6 alkyl, $-L-R_X$ and $-L-S_C$, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen; and

25 $R^{1'}$ and $R^{2'}$ are independently selected from the group consisting of hydrogen, cyano, halogen, carboxylic acid, sulfonic acid, C_1-C_6 alkyl, C_1-C_6 alkoxy, aryl, heteroaryl, $-L-R_X$ and $-L-S_C$, wherein said alkyl or alkoxy is optionally substituted by carboxylic acid, sulfonic acid, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C_1-C_6 alkyl, C_1-C_6 perfluoroalkyl, cyano, halogen, azido, carboxylic acid, sulfonic acid, or halomethyl;

30

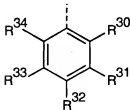
R^{20} and R^{21} are independently selected from the group consisting of hydrogen, cyano, halogen, carboxylic acid, sulfonic acid, C_1-C_6 alkyl, C_1-C_6 alkoxy, aromatic or heteroaromatic ring, $-L-R_x$ and $-L-S_C$, wherein said alkyl or alkoxy is optionally substituted by carboxylic acid, sulfonic acid, or halogen said aromatic or heteroaromatic ring is optionally substituted one or more times by C_1-C_6 alkyl, C_1-C_6 perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

J is O or $NR^{37}R^{38}$;

wherein R^{37} and R^{38} are independently selected from the group consisting of hydrogen, C_1-C_6 alkyl, aryl, heteroaryl, $-L-R_x$ and $-L-S_C$, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen; or R^{37} in combination with R^{38} forms a saturated 5- or 6-membered heterocycle that is a piperidine, a morpholine, a pyrrolidine or a piperazine, wherein said heterocycle is optionally substituted by methyl, carboxylic acid, or a carboxylic acid ester of a C_1-C_6 alkyl;

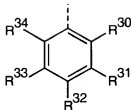
or R^{37} in combination with R^{20} , or R^{38} in combination with R^{21} , or both, form a 5- or 6-membered ring that is saturated or unsaturated, and is optionally substituted by one or more sulfonic acids, or C_1-C_6 alkyl that is optionally substituted by sulfonic acid;

Q is N or CR^{28} , wherein R^{28} is independently selected from the group consisting of hydrogen, F, CN, carboxylic acid, a carboxylic acid ester of a C_1-C_6 alcohol, a C_1-C_6 alkyl, $-L-R_x$ and $-L-S_C$, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen; or R^{28} comprises a formula



wherein R^{30} , R^{31} , R^{32} , R^{33} and R^{34} are independently selected from the group consisting of hydrogen, F, Cl, Br, I, sulfonic acid, carboxylic acid, CN, nitro, hydroxy, azido, amino,

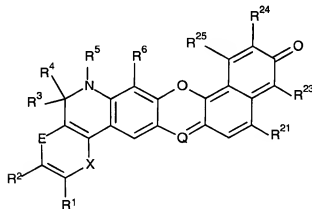
- 5 hydrazino, C₁-C₁₈ alkyl, C₁-C₁₈ alkoxy, C₁-C₁₈ alkylthio, C₁-C₁₈ alkanoylamino, C₁-C₁₈ alkylaminocarbonyl, C₂-C₃₆ dialkylaminocarbonyl, C₁-C₁₈ alkylloxycarbonyl, C₇-C₁₈ arylcarboxamido, -L-R_x and -L-S_C, wherein said alkyl or aryl portions of said R³⁰, R³¹, R³², R³³ and R³⁴ are optionally substituted one or more times by substituents selected from the group consisting of F, Cl, Br, I, hydroxy, carboxylic acid, a carboxylic acid ester of a C₁-C₆ alcohol, sulfonic acid, amino, C₁-C₆ alkylamino, C₂-C₆ dialkylamino and C₁-C₆ alkoxy; or a pair of adjacent R³⁰, R³¹, R³², R³³ and R³⁴ substituents when taken in combination, form a fused 6-membered aromatic ring that is optionally further substituted by carboxylic acid; and
- 10 wherein L is a covalent linkage;
- R_x is a reactive group; and
- 15 S_C is a conjugated substance.
16. The compound according to Claim 15, wherein said Q is N.
17. The compound according to Claim 15, wherein said J is O and said Q is CR²⁸.
- 20 18. The compound according to Claim 17, wherein one of said R⁵, R²¹, R³⁰, R³¹, R³², R³³, and R³⁴ is -L-R_x or -L-S_C.
19. The compound according to Claim 15, wherein
- 25 said R³ and R⁴ are each methyl;
- R¹ is H or a sulfonic acid;
- 30 R⁸ is H; and
- J is NR³⁷R³⁸.
20. The compound according to Claim 19, wherein Q is CR²⁸ and R²⁸ has the formula



- wherein one of R³⁰, R³¹, R³², R³³, and R³⁴ is -L-R_x or -L-S_C; and
- 5 wherein L is a single covalent bond, or L is a covalent linkage having 1-20 nonhydrogen atoms selected from the group consisting of C, N, O, P, and S, and
- wherein R_x is independently selected from the group consisting of an acrylamide, an activated ester of a carboxylic acid, an acyl azide, an acyl nitrile, an aldehyde, an alkyl halide, an amine, an anhydride, an aniline, an aryl halide, an azide, an aziridine, a boronate, a carboxylic acid, a diazoalkane, a haloacetamide, a halotriazine, a hydrazine,
- 10 an imido ester, an isocyanate, an isothiocyanate, a maleimide, a phosphoramidite, a reactive platinum complex, a sulfonyl halide, and a thiol group; and
- wherein S_C is independently selected from the group consisting of an amino acid, a peptide, a protein, a tyramine, a carbohydrate, an metal chelating moiety, a nucleoside, a nucleotide, an oligonucleotide, a nucleic acid, a hapten, a psoralen, a drug, a hormone,
- 15 a lipid, a lipid assembly, a polymer, a polymeric microparticle, a biological cell, and a virus.

21. A compound comprising a formula

20



5 wherein R¹, R², and R³ are independently selected from the group consisting of hydrogen, cyano, halogen, carboxylic acid, sulfonic acid C₁-C₆ alkyl, C₁-C₆ alkoxy, aryl, heteroaryl, -L-R_x and -L-S_C, wherein said alkyl or alkoxy is optionally substituted by carboxylic acid, sulfonic acid, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl, cyano, halogen, azido, carboxylic acid, sulfonic acid, or halomethyl;

10 or R¹ in combination with R² forms a fused aromatic or heteroaromatic ring that is optionally sulfonated one or more times, or said ring is substituted by -L-R_x or -L-S_C;

15 R³ and R⁴ are independently selected from the group consisting of hydrogen, C₁-C₆ alkyl, an aromatic or heteroaromatic ring, L-R_x and -L-S_C, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, hydroxy, or halogen and said aromatic or heteroaromatic ring is optionally substituted one or more times by C₁-C₆ alkyl, C₁-C₆ alkoxy, C₁-C₆ perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

20 or R² in combination with R³, or R³ in combination with R⁴, forms a 5- or 6-membered alicyclic ring;

25 R⁵ is independently selected from the group consisting of hydrogen, methyl, carboxymethyl, C₂-C₆ alkyl, aryl, heteroaryl, -L-R_x and -L-S_C, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

30 or R⁴ in combination with R⁵, or R⁵ in combination with R⁶, forms a 5- or 6-membered alicyclic ring;

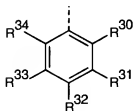
one of E and X is O, S, NR⁶, or CR^{1'}=CR^{2'}, and the other is absent;

wherein R^8 is independently selected from the group consisting of hydrogen, methyl, carboxymethyl, C_2-C_6 alkyl, $-L-R_x$ and $-L-S_C$, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen; and

$R^{1'}$ and $R^{2'}$ are independently selected from the group consisting of hydrogen, cyano, halogen, carboxylic acid, sulfonic acid, C_1-C_6 alkyl, C_1-C_6 alkoxy, aryl, heteroaryl, $-L-R_x$ and $-L-S_C$, wherein said alkyl or alkoxy is optionally substituted by carboxylic acid, sulfonic acid, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C_1-C_6 alkyl, C_1-C_6 perfluoroalkyl, cyano, halogen, azido, carboxylic acid, sulfonic acid, or halomethyl;

R^{21} , R^{23} , R^{24} , and R^{25} are independently selected from the group consisting of hydrogen, cyano, nitro, halogen, carboxylic acid, sulfonic acid, C_1-C_6 alkyl, aromatic or heteroaromatic ring, $-L-R_x$ and $-L-S_C$, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, or halogen said aromatic or heteroaromatic ring is optionally substituted one or more times by C_1-C_6 alkyl, C_1-C_6 perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

Q is N or CR^{28} , wherein R^{28} is independently selected from the group consisting of hydrogen, F, CN, carboxylic acid, a carboxylic acid ester of a C_1-C_6 alcohol, a C_1-C_6 alkyl, $-L-R_x$ and $-L-S_C$, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen; or R^{28} comprises a formula



wherein R^{30} , R^{31} , R^{32} , R^{33} and R^{34} are independently selected from the group consisting of hydrogen, F, Cl, Br, I, sulfonic acid, carboxylic acid, CN, nitro, hydroxy, azido, amino, hydrazino, C_1-C_{18} alkyl, C_1-C_{18} alkoxy, C_1-C_{18} alkylthio, C_1-C_{18} alkanoylamino, C_1-C_{18} alkylaminocarbonyl, C_2-C_{36} dialkylaminocarbonyl, C_1-C_{18} alkylloxycarbonyl, C_7-C_{18}

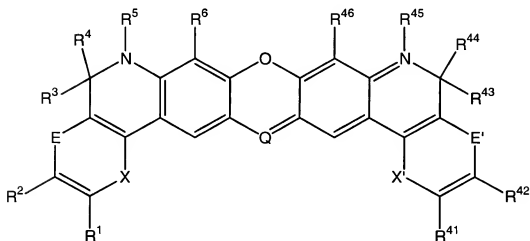
arylcarboxamido, -L-R_x and -L-S_C, wherein said alkyl or aryl portions of said R³⁰, R³¹, R³², R³³ and R³⁴ are optionally substituted one or more times by substituents selected from the group consisting of F, Cl, Br, I, hydroxy, carboxylic acid, a carboxylic acid ester of a C₁-C₆ alcohol, sulfonic acid, amino, C₁-C₆ alkylamino, C₂-C₆ dialkylamino and C₁-C₆ alkoxy; or a pair of adjacent R³⁰, R³¹, R³², R³³ and R³⁴ substituents when taken in combination, form a fused 6-membered aromatic ring that is optionally further substituted by carboxylic acid; and

wherein L is a covalent linkage;

R_x is a reactive group; and

S_C is a conjugated substance.

22. A compound having a formula:



wherein R¹, R², R⁶, R⁴¹, R⁴², and R⁴⁶ are independently selected from the group consisting of hydrogen, cyano, halogen, carboxylic acid, sulfonic acid C₁-C₆ alkyl, C₁-C₆ alkoxy, aryl, heteroaryl, -L-R_x and -L-S_C, wherein said alkyl or alkoxy is optionally substituted by carboxylic acid, sulfonic acid, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl, cyano, halogen, azido, carboxylic acid, sulfonic acid, or halomethyl;

or R¹ in combination with R², or R⁴¹ in combination with R⁴², or both, forms a fused aromatic or heteroaromatic ring that is optionally sulfonated one or more times, or said ring is substituted by -L-R_x or -L-S_C;

5

R³, R⁴, R⁴³, and R⁴⁴ are independently selected from the group consisting of hydrogen, C₁-C₆ alkyl, an aromatic or heteroaromatic ring, L-R_x and -L-S_C, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, hydroxy, or halogen and said aromatic or heteroaromatic ring is optionally substituted one or more times by C₁-C₆ alkyl, C₁-C₆ alkoxy, C₁-C₆ perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

10

or R² in combination with R³, or R⁴² in combination with R⁴³, or R³ in combination with R⁴, or R⁴³ in combination with R⁴⁴, or any combination thereof, forms a 5- or 6-membered alicyclic ring;

15

R⁵ and R⁴⁵ are independently selected from the group consisting of hydrogen, methyl, carboxymethyl, C₂-C₆ alkyl, aryl, heteroaryl, -L-R_x and -L-S_C, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen and said aryl or heteroaryl is optionally substituted one or more times by C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl, cyano, halogen, carboxylic acid, sulfonic acid, or halomethyl;

20

or R⁴ in combination with R⁵, or R⁵ in combination with R⁶, or R⁴⁴ in combination with R⁴⁵, or R⁴⁵ in combination with R⁴⁶, or any combination thereof, forms a 5- or 6-membered alicyclic ring;

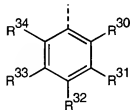
25

wherein one of said E, E', X' and X is O, S, or NR⁸, provided that E and X or E' and X' are not both present;

30

wherein R⁸ is independently selected from the group consisting of hydrogen, methyl, carboxymethyl, C₂-C₆ alkyl, -L-R_x and -L-S_C, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen; and

Q is N or CR^{28} , wherein R^{28} is independently selected from the group consisting of hydrogen, F, CN, carboxylic acid, a carboxylic acid ester of a $\text{C}_1\text{-C}_6$ alcohol, a $\text{C}_1\text{-C}_6$ alkyl, $-\text{L-R}_x$ and $-\text{L-S}_C$, wherein said alkyl is optionally substituted by carboxylic acid, sulfonic acid, amino, or halogen; or R^{28} comprises a formula



wherein R^{30} , R^{31} , R^{32} , R^{33} and R^{34} are independently selected from the group consisting of hydrogen, F, Cl, Br, I, sulfonic acid, carboxylic acid, CN, nitro, hydroxy, azido, amino, hydrazino, $\text{C}_1\text{-C}_{18}$ alkyl, $\text{C}_1\text{-C}_{18}$ alkoxy, $\text{C}_1\text{-C}_{18}$ alkylthio, $\text{C}_1\text{-C}_{18}$ alkanoylamino, $\text{C}_1\text{-C}_{18}$ alkylaminocarbonyl, $\text{C}_2\text{-C}_{36}$ dialkylaminocarbonyl, $\text{C}_1\text{-C}_{18}$ alkylloxycarbonyl, $\text{C}_7\text{-C}_{18}$ arylcarboxamido, $-\text{L-R}_x$ and $-\text{L-S}_C$, wherein said alkyl or aryl portions of said R^{30} , R^{31} , R^{32} , R^{33} and R^{34} are optionally substituted one or more times by substituents selected from the group consisting of F, Cl, Br, I, hydroxy, carboxylic acid, a carboxylic acid ester of a $\text{C}_1\text{-C}_6$ alcohol, sulfonic acid, amino, $\text{C}_1\text{-C}_6$ alkylamino, $\text{C}_2\text{-C}_6$ dialkylamino and $\text{C}_1\text{-C}_6$ alkoxy; or a pair of adjacent R^{30} , R^{31} , R^{32} , R^{33} and R^{34} substituents when taken in combination, form a fused 6-membered aromatic ring that is optionally further substituted by carboxylic acid; and

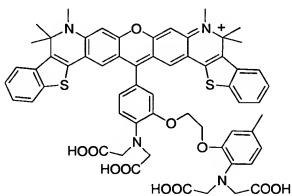
wherein L is a covalent linkage;

R_x is a reactive group; and

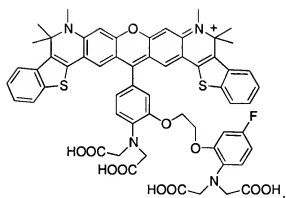
S_C is a conjugated substance;

with the proviso that at least one of R^1 , R^2 , R^3 , R^4 , R^5 , R^6 , R^8 , R^{28} , R^{30} , R^{31} , R^{32} , R^{33} , R^{34} , R^{41} , R^{42} , R^{43} , R^{44} , R^{45} and R^{46} is a conjugated substance.

23. The compound according to Claim 22, wherein E and E' are each S; R¹ in combination with R² form an aromatic ring and R⁴¹ in combination with R⁴² form an aromatic ring.
24. The compound according to Claim 23, wherein said conjugated substance is independently selected from the group consisting of an amino acid, a peptide, a protein, a tyramine, a carbohydrate, a metal chelating moiety, a nucleoside, a nucleotide, an oligonucleotide, a nucleic acid, a hapten, a psoralen, a drug, a hormone, a lipid, a lipid assembly, a polymer, a polymeric microparticle, a biological cell, and a virus.
25. The compound according to Claim 24, wherein said conjugated substance is a metal chelating moiety wherein said metal chelating moiety is optionally substituted by a reactive group.
26. The compound according to Claim 25, wherein said metal chelating moiety is BAPTA.
27. The compound according to Claim 26, wherein said R²⁸ is said BAPTA.
28. The compound according to Claim 27, wherein said reactive group is selected from the group consisting of a carboxylic acid, a succinimidyl ester of a carboxylic acid, a maleimide, a cadaverine, a benzophenone, an aryl azide and a diazirine.
29. The compound according to Claim 27, wherein said compound is according to formula



or



30. The compound according to Claim 28, wherein said compound is according to formula

